

Answers to Chairman Rand's Question on Deadweight Tax Losses

A) At the November 29, 2006 meeting of the State and Local Fiscal Modernization Study Commission, Senator Rand asked for an example of a "deadweight" loss. This note attempts to provide examples, and reports on some rough estimates.

B) Deadweight tax losses occur because taxes tend to cause people to change their economic choices in ways that reduce tax liability. The changes take time and effort, which are costly per se. Further, when some commodities and activities are taxed less than others, people tend to substitute away from the more heavily taxed commodities. This reduces the economic value of the commodities and activities people choose. Recall the example of England's tax on windows. People built houses with fewer windows to avoid the tax. But houses with fewer windows must have lower value, otherwise the English would have built houses with fewer windows before the tax was enacted.

C) Examples:

a) Taxes may cause some folks to divert time and effort away from productive activities, such as work and saving, toward less productive activities (more time at home and consuming). Over time, these choices reduce the level of capital in the economy and the level of production: that is, they reduce the level of society's wealth and the value of what we produce, so they are deadweight losses.

b) However, if the tax system allows workers to shelter economic effort from taxes, then it is possible for workers to reduce tax liabilities without reducing work effort and saving. This occurs when middle and high income households pay tax professionals to develop tax shelters and means to shift funds into tax shelters. This diverts professional time and effort from socially productive activity toward reducing taxes. If tax shelters were removed, those professionals' resources would be spent on more productive activities. In this case, taxes may not cause social wealth and the value of production to decline. There is deadweight loss nevertheless. However, in this case, the deadweight loss is the cost of paying professionals to shelter income: society loses the value of the other services professionals could have provided.

c) Selected additional examples (there are many more):

i) Sales tax differences across states cause some folks to cross state lines to shop. Tennessee has one of the highest sales tax rates in the country. Reports are that many Tennessee Volunteers drive to Georgia, Kentucky, and Virginia to shop where sales tax rates are lower. The deadweight loss includes the time and other costs of traveling across state lines to shop.

ii) Property taxes cause some firms or folks to choose where to locate in order to lower tax rates. This point can be exaggerated. Of course, many firms and people choose where to live based on quality of work and life criteria, and not just for taxes. But deadweight loss occurs if some families choose to live in jurisdictions they would not otherwise choose, in order to pay lower property taxes, or because

they believe the government services in a jurisdiction do not compensate for the taxes owed.

iii) Labor economists have produced a good deal of evidence indicating that relatively high income tax rates tend to cause spouses of high income earners to opt out of the work force. The deadweight loss is lower income (minus the value of more time at home).

iv) Business income taxes cause some firms to invest less in capital than they would otherwise. The deadweight loss is the capital value given up because the capital stock is lower than otherwise.

D) Deadweight losses are inescapable. *No* existing tax system is efficient. Oliver Wendell Holmes said taxes are the price paid for civilized society. Deadweight losses are too. But some taxes create more deadweight loss than others, even though they raise equal revenue. Therefore, deadweight losses can be reduced by replacing a very inefficient tax with a less inefficient tax. In this way tax reform has potential to reduce deadweight losses to the minimum consistent with the other principles of tax reform, and, thereby, to improve social welfare.

E) Some Measurements of Deadweight Losses

1) A one percentage point increase in a tax rate tends to cause a more than one percentage point increase in deadweight loss. Therefore, a tax rate of 20% has a deadweight loss that is more than twice the loss from a 10% tax rate. One reason for this is that as a tax on an activity increases, people tend to substitute away from that activity, so the tax base shrinks (Dr. Roland Stephen mentioned this crucial point in his presentations). The decline in tax revenue is an additional deadweight loss. This explains why high tax rates can be very damaging, and why broadening tax bases, which permits lower rates, can be very beneficial.

a) Dr. Jerry Hausman used an economic model to estimate the deadweight loss of state and federal telecommunication taxes.¹ The deadweight loss occurs because the tax causes some people not to use cell phones, causes some people to use cell phones less than they otherwise would, and causes some people to take time and trouble to purchase wireless services in low tax states. Hausman estimates indicate that for each \$1 in revenue raised by telecommunication taxes, there is about a \$0.53 deadweight loss.

b) Dr. Charles Ballard and his colleagues used an economic model to estimate the excess burden of the entire U.S. tax system, as it was structured in 1973.² This includes federal, state, and local taxes.

i) I do not know of a similar study published since then. In 1973, federal income tax rates were much higher than now. For this reason the 1973 figures tend to overestimate current deadweight losses. State tax rates

¹ Hausman, 9/2000, Efficiency effects on the U.S. economy from wireless taxation, *National Tax Journal*, 733-42.

² Ballard et al., 6/1985, The total welfare cost of the United States tax system, *National Tax Journal*, 125-40.

were much lower in 1973, and spending shifts, away from goods and towards services, have become much more pronounced since 1973. This leads to an underestimate. On net, the estimates are almost surely a large overestimate, because federal tax rates have declined more than state tax rates have risen. The estimates are offered as a very rough guide to possible sizes of deadweight losses on the theory that some information is better than none.

ii) Deadweight losses of the 1973 U.S. tax system occurred because taxes caused people to shift activities and spending away from taxed activities and spending. The income tax tends to reduce work effort and saving, and causes firms to invest less. The sales tax causes people to shift away from taxed goods toward untaxed services, and to shop where sales tax rates are relatively low. Also, the tax tends to alter business use of production inputs subject to the sales tax. For example, firms would have a tax incentive to repair rather than replace worn out machinery if repairs are not taxed but new machines are taxed. Finally, the property tax affects some decisions to locate.

iii) Ballard's estimates indicate that in 1973, the entire U.S. tax system produced a deadweight loss of between 4% and 7% of Gross Domestic Product (*GDP*). This indicates a national deadweight loss of between \$442.0 billion and \$773.0 billion inflation-adjusted dollars.

iv) To get a very rough back-of-envelope guess at what a deadweight loss of the size measured by Ballard et al. could have meant for North Carolina, consider that in 2005 North Carolina inflation-adjusted Gross State Product was about \$310 billion, or about 2.8% of inflation-adjusted *GDP*. Assuming it is reasonable to extrapolate the national deadweight loss to North Carolina, the estimates suggest a deadweight loss between \$12.4 billion (that is, $0.028 \times \$442$ billion) and \$21.6 billion. This is a large overestimate, first because tax structure has changed, and second because many other states had much more damaging tax structures than North Carolina in 1973. But even if these numbers overestimate the true deadweight loss by 75%, the North Carolina loss from all taxes would be between \$3.1 billion and \$5.4 billion.

c) A long-run economic growth model has been used to estimate deadweight losses from a typical state and local tax system.³ Four sets of deadweight losses and a potential efficiency gain were estimated. These deadweight losses (and the gain) are measured as percentages of annual inflation-adjusted consumption. The estimates are:

i) Loss from not applying sales tax to *all* services $\approx 0.11\%$. In other words, in a typical state the deadweight loss resulting from taxing mostly

³ Russo, 10/2005, An Efficiency analysis of proposed state and local sales tax reforms, *Southern Economic Journal*, 443-462.

manufactured goods, and very few services, is estimated to be worth as much as 0.11% of one year's consumption by citizens of the state.

ii) Loss from applying sales tax to business inputs $\approx 0.05\%$

iii) Combined loss from a) and b) $\approx 0.2\%$

iv) Loss from taxing personal income instead of sales $\approx 0.33\%$ ⁴

v) Based on the above results it is possible to estimate the potential gain from applying sales tax to all services, eliminating sales on business inputs, and using new sales tax revenue produced to reduce the personal income tax rate. The potential gain is 0.55% of consumption.

d) The results described above can be extrapolated to North Carolina. Inflation-adjusted annual consumption in North Carolina in 2005 was about \$211 billion (about 68% of inflation-adjusted Gross State Product). The estimates are:

i) loss from not applying sales tax to *all* services $\approx \$232.0$ million
($0.0011 * \$211.0$ billion)

ii) loss from applying sales tax to business inputs $\approx \$105.4$ million

iii) combined loss from a) and b) $\approx \$421.0$ million

iv) loss from taxing personal income instead of sales $\approx \$698.6$ million

v) potential gain from applying sales tax to all services, eliminating sales on business inputs, using new revenue generated to reduce personal tax rate $\approx \$1.16$ billion

2) Numbers have a tendency to create a misleading appearance of precision. These estimates are only very rough guesses. Nevertheless, I believe that the fact the estimates tend to be in the hundreds of millions of dollars indicates that deadweight losses are substantial. This suggests that tax reforms that reduce deadweight losses can result in sizable increases in social welfare. It is important to note that the estimates based on state and local taxes are produced by a long-run model. This means that it could take many years to achieve efficiency gains from tax reform.

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⁴ This can be thought of as the loss that would occur by replacing state and local sales taxes with higher income taxes. Alternatively, it can be thought of as the gain that could be realized by reducing a relatively high personal income tax and replacing lost revenue with higher sales taxes.